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ABSTRACT

Presented is a beginning course in biology with emphasis on ecology for students with limited interest and few experiences in science. These students most likely will not take many more science courses. Included are the basic ecological concepts of communities, population, societies and the effects humans have on the environment. Like all other modules in the Quinmester Program, the performance objectives are listed and the course outline presented. The ecological study focuses on the flora and fauna found in South Florida. Main topics include: (1) Plant and Animal Populations and Communities, (2) Food Webs and Pollution, and (3) Prospects for the Future. The latter is based on the effects of increased population in South Florida. (EB)

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AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM

YOUR WORLD AND WELCOME TO IT

5314.03

SCIENCE

(Experimental)

SE 016 518

DADE COUNTY PUBLIC SCHOOLS

DIVISION OF INSTRUCTION • 1971

ED 079141

YOUR WORLD AND WELCOME TO IT

5314.03

SCIENCE

(Experimental)

Written by David Z. Kleinman
for the
DIVISION OF INSTRUCTION
Dade County Public Schools
Miami, Florida
1972

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YOUR WORLD AND WELCOME TO IT

COURSE DESCRIPTION

Your World and Welcome To It is a beginning elective course in general biology with emphasis on ecology. It will cover the basic ecological concepts of communities, populations, societies and the effects humans have on the environment.

ENROLLMENT GUIDELINES

This is a terminal course for students with limited interest and few experiences in science.

STATE ADOPTED TEXTS

1. Biological Sciences Curriculum Study. Patterns and Processes. New York: Holt, Rinehart and Winston, 1966.

2. Brandwein, Paul F.; Burnett, R. Will; and Stollberg, Robert F. Life: Its Forms and Changes. New York: Harcourt, Brace and World, 1968.

3. Oxenhorn, Joseph M., and Idelson, Michael, N. Pathways in Science: Biology 1. New York: Globe Book Company, 1968.

4. Oxenhorn, Joseph M. Pathways in Science: Biology 2. New York: Globe Book Company, 1968.

5. Oxenhorn, Joseph M. Pathways in Science: Biology 3. New York: Globe Book Company, 1968.

6. Thurber, Walter A. and Kilburn, Robert A. Exploring Life Science. Boston: Allyn and Bacon, Inc., 1966.

PERFORMANCE OBJECTIVES

The student will:

1. Describe one plant and one animal community found in South Florida.
2. Construct a standard food web for the Everglades.
3. Predict the ecological consequences of continued population growth in South Florida.
4. Predict the effect of pollution and population growth on the quality of life in South Florida.
5. Identify the main characteristics of a given animal population and predict the cause and effect relationships of disrupting influences such as pollution, over-crowding and the decrease of predators.
6. Recognize at least one member of each of the major animal groups (phyla) and describe two characteristics by which the group is distinguished.
7. Construct a flow chart which shows the relationship between photosynthesis and the foods the student has in his diet.
8. Name the major categories of food, (protein-fat-etc.) and be able to identify at least five foods which are sources of these nutrients.

COURSE OUTLINE

I. Plant and Animal Populations and Communities

   A. What is a population?

      1. Abiotic needs

      2. Means of survival

         a. Natural selection
         b. Human interference

            (1) Dog breeding
            (2) Cattle breeding
            (3) Destruction of natural enemies
            (4) Introduction of exotics

COURSE OUTLINE (Continued)

3. Population balance

4. Territoriality

B. What is a community?

1. How communities form

2. Barriers between communities

3. Interacting communities

4. Human effect on plant and animal communities

a. Farming
b. Cities

C. Abiotic factors in communities

1. Temperature range

a. Narrow
b. Wide

2. Annual rainfall

3. Soil

a. Sandy
b. Clay
c. Loam
d. Mineral content

4. Climate

a. Hot-cold
b. Arid-moist

II. Food Webs and Pollution

A. What is a food web?

1. Producers

2. Consumers

3. Scavengers

4. Decomposers

COURSE OUTLINE (Continued)

B. What is pollution?

1. Sewage and garbage

2. Insecticides and other chemicals

3. Smog

4. Others

C. Food webs and pollution

1. Algae blooms

a. How they are caused
b. Fish kills

2. Lake Apopka and Lake Okeechobee

a. Draining swamps
b. Excessive nutrient runoff
c. Eutrophication

3. Effect of pollution on communities

a. Loss of food supplies
b. Destruction of breeding grounds

III. Prospects for the future

A. Population growth in South Florida

1. Before 1960

2. The 1970 census

3. Predictions for 1980 and beyond

B. Effects of increased population

1. Fresh water supply

2. Sewage and garbage disposal

3. Recreation

4. The overall quality of life

COURSE OUTLINE (Continued)

C. Effects on food and health

1. Major food groups

2. A balanced diet

EXPERIMENTS

Biological Sciences Curriculum Study. High School Biology. Green Version, 2nd ed. Chicago: Rand McNally and Company, 1968.

1. Observation of Living Things (Investigation 1.1, p. 7)
2. Interrelationship Between Producers and Consumers (Investigation 1.5, p. 7)
3. Population Growth: A Model (Investigation 2.1, p. 43)
4. Study of a Yeast Population (Investigation 2.2, p. 53)
5. Study of a Biotic Community (Investigation 3.1, p. 76)
6. Structural Characteristics in the Identification of Animals (Investigation 4.2, p. 139)
7. Photosynthetic Rate (Investigation 12.5, p. 438)

Biological Sciences Curriculum Study. Patterns and Processes. New York: Holt, Rinehart and Winston, Inc., 1966.

8. Population Growth (Laboratory Activity S-15, p. 24)
9. Population Growth (Laboratory Activity S-19, p. 44)
10. Food Chain (Laboratory Activity S-27, p. 57)
11. Food (Laboratory Activity S-37, p. 78)
12. Photosynthesis (Laboratory Activity S-58, p. 105)

Brandwein, Paul F.; Burnett, R. Will and Stollberg, Robert F. Life: its Forms and Changes. New York: Harcourt, Brace and World, 1968.

13. An Apprentice Investigation of Variety in Protozoans (pp. 311-312)
14. An Apprentice Investigation of Hydra (pp. 317-320)
15. An Apprentice Investigation into the Development Of a Frog (p. 388)

Curriculum Bulletin 8F. Biology. Miami: Dade County School Board, 1968.

16. Plants, Animals or Protists (p. 18)
17. Grouping Plants and Animals (p. 20)
18. To Eat or Not To Eat (p. 41)

EXPERIMENTS (Continued)

Thurber, Walter A. and Kilburn, Robert A. Exploring Life Science. Boston: Allyn and Bacon Inc., 1966.

19. Sugar (pp. 148-151)
20. Starch (pp. 152-155)
21. Fats and Oils (pp. 156-158)
22. Calories (p. 159)
23. Protein (pp. 160-163)
24. Vitamin (pp. 164-167)
25. Flour (pp. 168-169)
26. Photosynthesis (pp. 389-395)
27. Discovery Relationships (pp. 406-411)
28. Classification of Plants and Animals (pp. 412-415)
29. The Plant Kingdom (pp. 416-421)
30. Man's Influence on His Environment (pp. 434-437)
31. Man's Influence on Nature (pp. 438-443)
32. Harmful Relationships (pp. 18-22)
33. Beneficial Relationships (pp. 23-27)
34. Analyzing a Community (pp. 30-33)

DEMONSTRATIONS

1. Demonstrate the need for fertilizer in plant growth.

2. Use fermentation to show the breakdown of food to produce energy for living things.

3. Demonstrate parasitism, mutualism and commensalism in the bushes and trees on the school grounds.

4. Observe the animals which live in bushes or trees on your school grounds and identify as many as you can as:

   1. Plant eaters
   2. Animal or insect eaters
   3. Scavengers

5. Demonstrate the way in which a population of insects can become immune to an insecticide.

PROJECTS

1. Make a poster or notebook showing a food web in the Everglades.

2. Make a classroom display containing a picture, model, or actual specimen of each of the animals listed below. Make a label for each giving the name of the animal and two characteristics of each.

   a. Protozoa
   b. Sponges
   c. Coelenerates
   d. Flatworms
   e. Segmented worms
   f. Roundworms
   g. Mollusks
   h. Echinoderms
   i. Fish
   j. Amphibians
   k. Reptiles
   l. Birds
   m. Mammals

3. Make a terrarium which will show a food web.

4. Compare the mouth parts of several animals to determine the types of food they eat.

5. Make a display of several different types of edible seeds found in South Florida.

6. Make a poster showing the following relationships between living organisms:

   a. Parasitism
   b. Commensalism
   c. Mutualism

7. Make an insect collection which shows 10 insects which are harmful and 10 which are helpful to people.

8. Make a display showing the vitamins, minerals, and elements found in the human body, and show the foods in which they are found.

9. Make a graph of population growth for the city of Miami since it began. Follow the steps used in Experiment #9. Predict the effects of this growth on the city's water supply.

PROJECTS (Continued)

10. Make a graph of the population growth in the United States since 1900.

    a. Use census figures
    b. Determine the rate of growth in percent
    c. Use the percent of growth to project our population in 1980, 1990, and 2000.

11. Devise a classification scheme for the plants or animals found around school grounds.

REPORTS

1. How to prepare foods to prevent the loss of valuable nutrients.
2. Diseases and disorders caused by the lack of vitamins or minerals in food.
3. Minerals essential to good health.
4. Mercury pollution and ways to control it.
5. The effects of sulfur dioxide on our bodies and belongings.
6. Noise pollution.
7. The main characteristics of the major animal groups.
8. What is a food web?
9. Freshwater plant and animal communities.
10. What happens when predators are destroyed?
11. The population explosion.
12. Sewage, drought and Lake Okeechobee.
13. The effect of exotic (not native) plants and animals on the native population.

FIELD TRIPS

1. Crandon Park Zoo
   Key Biscayne

2. Redland Fruit and Spice Park
   24802 S. W. 187 Street
   Miami, Florida
   Telephone: 247-5727

3. Everglades National Park
   State Road 27
   Homestead, Florida
   Telephone: 247-6211

4. Sewage Treatment Plant
   Virginia Key
   Telephone: 665-7471

5. Seaquarium
   Rickenbacker Causeway

SPEAKERS

1. Dade County Air and Water Pollution Control District
   864 N. W. 23rd Street
   Miami, Florida

2. Environmental Education Committee of the University of Miami
   P. O. Box 8236
   University of Miami Beach
   Coral Gables, Florida

3. Environmental Science Services Administration (ESSA)
   901 S. Miami Avenue
   Miami, Florida

4. Water Resources Division, U.S. Geological Survey
   Box 348, Coconut Grove Station
   Miami, Florida

FILMS AVAILABLE FROM DADE COUNTY AUDIOVISUAL CENTER

1. The Invertebrates
   AV# 1-11145, 14', B/W

2. Life In A Drop Of Water
   AV# 1-02719, 10', B/W

3. Lichens and Mosses
   AV# 1-11113, 22', C

4. Sponges and Coelenterates
   AV# 1-02172, 11', B/W

5. Characteristics of Plants and Animals
   AV# 1-10079, 19', C

6. Coral Wonderland
   AV# 1-30697, 30', C

7. Water and Life
   AV# 1-11054, 15', C

8. Photosynthesis
   AV# 1-30628, 28', C

9. Understanding Vitamins
   AV# 1-11287, 14', B/W

10. Food and Nutrition
    AV# 1-03128, 11', B/W

11. What Is Ecology?
    AV# 1-11064, 11', C

12. Balance of Nature
    AV# 1-11141, 20', C

13. The Web of Life Part 1
    AV# 1-10202, 17', C

14. The Web of Life Part 2
    AV# 1-11063, 16', C

15. Animal Predators and the Balance of Nature
    AV# 1-05650, 11', C

16. Between The Tides
    AV# 1-11071, 20', C

FILMS AVAILABLE FROM DADE COUNTY AUDIOVISUAL CENTER (Continued)

17. Man's Problem
AV# 1-13338, 19', C

18. Animals That Live In the Surf
AV# 1-02699, 11', C

19. Animals Unlimited
AV# 1-11123, 20', C

20. Battle of Bugs
AV# 1-03722, 11', C

21. Birds of a Florida Marsh
AV# 1-11196, 14', C

22. The Bird Community
AV# 1-02904, 12', C

23. Conservation of Natural Resources
AV# 1-00409, 11', B/W

24. Conserving Our Forests Today
AV# 1-03767, 11', C

25. Conserving Our Soil Today
AV# 1-00424, 11', C

26. Conserving Our Water Resources Today
AV# 1-00426, 11', C

27. Plants Make Food
AV# 1-02287, 11', C

FILMS

Free films on wildlife, pollution, and ecology are available from:

1. Film Library
Game and Freshwater Fish Commission
Tallahassee, Florida

2. Film Library
Board of Conservation
Tallahassee, Florida

SLIDES AVAILABLE FROM DADE COUNTY AUDIOVISUAL CENTER

1. Everglades National Park
   AV# 5-20095, 14 color slides

2. Field Trip to Miami City Water Plant
   AV# 5-20089, 32 color slides

3. Subtropical Fruits We Eat (Part 1)
   AV# 5-20050, 23 color slides

4. Subtropical Fruits We Eat (Part 2)
   AV# 5-20009 23 color slides

5. Trees
   AV# 5-20078, 29 color slides

6. Trees and Flowering Plants
   AV# 5-20001 30 color slides

FILMSTRIPS AND FILM LOOPS

The following are available from:

Wards Natural Science Establishment
P. O. Box 1712
Rochester, New York 14603

1. Man's Impact on His Environment
   168W9000..Set of 9 filmstrips (Color) - $63.00

2. Checks and Balances In Nature
   168W9020..Set of 8 filmstrips (Color) - $56.00

3. Environmental Pollution: Our World In Crisis
   70W3800..Set of 6 filmstrips - $40.00

4. Diatoms in a Food Web
   183X5130..3½ minutes - $20.50

5. The Pond Environment (Part 1)
   73W1869..4 minutes - $19.95

6. The Pond Environment (Part 2)
   73W1870..3 minutes - $19.95

FILMSTRIPS AND FILM LOOPS (Continued)

7. The Pond Environment (Part 3)
73W1871..3 minutes, 30 seconds - $19.95

8. End Products (Photosynthesis)
73W1685..4 minutes, 10 seconds - $19.95

DISCUSSION QUESTIONS

1. Discuss succession in a plant or animal community.
2. Discuss the relationship between soil minerals and rainfall on the type of plant and animal community.
3. What would happen to Lake Okeechobee in the next thousand years if there were no people in Florida?
4. How does pollution act as a time telescoping machine on lakes and ponds?
5. Discuss the advantages of using insects to control other insects.
6. Discuss the changes which have taken place in your neighborhood, the school's neighborhood and in your part of the county as far back as you can. Predict the changes and their consequences for 1980.
7. Discuss the probable reasons for the decrease in the number of pelicans in Biscayne Bay.
8. Discuss the term "empty calories".
9. Discuss the South Florida drought of 1971.
10. How does the Army Corps of Engineers affect your environment?

ADDITIONAL INNOVATIVE ACTIVITIES

1. Word puzzle (see next page)
2. Write a poem or song to express your concern about the environment.
3. Write to your congressman or senators to find out what he is doing to help preserve our resources.
4. Have a pro - con debate on the use of pesticides.

ADDITIONAL INNOVATIVE ACTIVITY (Continued)

STUDENT OBJECTIVE: Given a number of scrambled letters, the student will circle only those words which pertain to the course - Your World and Welcome To It according to the directions printed below.

PURPOSE: To give students practice identifying words associated with this course.

INSTRUCTIONS:

1. The letters below contain words from the course Your World and Welcome To It.
2. Circle as many words as you can find. They are written forward, backward, up, down, and diagonally.
3. As you find the words write them in the column at the side of the page.
4. Circle all the words you find, but write them only once.
5. Write one word on each line of the column at the side of the page.
6. All words must have five or more letters.
7. Define or describe the words you find on the back of this paper.

ANSWER LIST:

1. Everglades
2. algae
3. animal
4. community
5. population
6. pollution
7. plant
8. phyla
9. predator
10. photosynthesis
11. vitamin
12. mineral
13. potein
14. exotic
15. native
16. consumer
17. scavenger
18. decomposer
19. sewage
20. insect
21. bloom
22. swamp
23. hydra
24. protozoa
25. calorie
26. reptile

ADDITIONAL INNOVATIVE ACTIVITY (Continued)

D S I S E H T N Y S O T O H P
E B C D R E G N E V A C S R O
C R E L E M E N T J H G E F P
O E Y K A H L M N P Q D X R U
M M T L O Y W E V T A S O R L
P U I A Z D X V Y T Z T T F A
O S N R O R N E O B E C I D T
S N U E T A I R A I J H C G I
E O M N O S M G N K N L M R O
R C M I R W A L I A P S E N N
G A O M P A T A M Q T P E R S
P J C L X M I D A W T I V C T
D H A L O P V E L I X E V Y T
C N Y O G G F S L D C A B E Z
T K L L H J Y E K L M G N P Q
B B W C A L O R I E V L T S R
P O L L U T I O N E G A W E S

1. _____
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24. _____
25. _____
26. _____

REFERENCES

1. Ardrey, Robert. The Social Contract. New York: Atheneum Inc., 1970.

2. Ardrey, Robert. The Territorial Imperative. New York: Atheneum, Inc., 1968.

3. Brevsse, Peter A. "Sound Pollution Another Urban Problem". The Science Teacher. April, 1970.

4. Davis, Adelle. Let's Cook It Right. New York: Signet Books, 1969.

5. Davis, Adelle. Let's Eat Right To Keep Fit. New York: Signet Books, 1970.

6. Ehrlich, Paul R. The Population Bomb. New York: Ballantine Books, Inc., 1970.

7. Farb, Peter. Ecology. New York: Time Life Books Inc., 1969.

8. Gordon, James S. "We're Poisoning Ourselves With Noise". Reader's Digest. February, 1970.

9. Odom, Eugene P. Fundamentals of Ecology. Philadelphia: W. B. Saunders and Company, 1959.

10. Perry, John. Our Polluted World. New York: Franklin Watts, 1967.

11. Stephens, William; Kleinman, David Z.; and O'Connor, James. South Florida Environmental Science. Bulletin 882-MU-11. Miami, Florida Dade County Public Schools, 1970.

12. Zim, Herbert S. A Guide To Everglades National Park. New York: Golden Press, 1960.

The following are available from:

Dade County Agricultural and Home Economics Department
2690 N. W. 7th Avenue, Miami, Florida 33127 - or -
18710 S. W. 288th Street, Homestead, Florida 33030

13. Botany Handbook For Florida

14. Household Insects and Their Control Bulletin

REFERENCES (Continued)

The following are available from:

Dade-Monroe Tuberculosis and Respiratory Disease Association
830 S. E. First Avenue
Miami, Florida 33131

15. Air Pollution Primer

16. Air Pollution, The Facts

The following are available from:

National Agricultural Chemicals Association
1155 - 15th Street N. W.
Washington, D. C. 20005

17. Ravaged Summer, It's The Natural Sequel to Silent Spring

18. An Ecologist Views His Environment

The following are available from:

National Wildlife Federation
1412 - 16th Street N. W.
Washington, D. C.

19. The Case Against Hard Pesticides

20. Wildlife Of Farm and Field

21. Wildlife of Coastal Waters

22. Clean Water Its Up To You

23. Water

24 Soil Means Life

25. Estuaries

26. 1970 National EQ Index

REFERENCES (Continued)

The following are available from:

U. S. Department of the Interior
Federal Water Pollution Control Administration
Washington, D. C. 20242

27. A Primer On Waste Water Treatment

28. What You Can Do About Water Pollution

29. Needed: Clean Water

30. Needed: Clean Air

The following are available from:

United States Department of Health, Education and Welfare
Washington, D. C.

31. Is It Goodbye Green Earth?

32. Noise As a Health Hazard At Work, In the Community and in the Home

33. Ecologos (a bibliography of the environment)

1	01. [illegible] 2-42 02. [illegible] 1,2, 3 03. [illegible] 1 04. [illegible] 12-49	1,7,12, 14,24	4	3,9	9,9	1,2,3	2	6,11,17,19, 24,25,28, 31,22	5,6,7	1,5,6	1,2	1	1,2,[illegible] 28,25,[illegible]
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